UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,406	07/01/2003	Jens Gebhardt	06580024AA	9432

7590 07/12/2005

McGuireWoods LLP
Suite 1800
1750 Tysons Boulevard
McLean, VA 22102-4215

EXAMINER	
BARNEY, SETH E	

ART UNIT	PAPER NUMBER
3752	

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/609,406	GEBHARDT, JENS	
	Examiner	Art Unit	
	Seth Barney	3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *5-12,14,16,17,21-23 and 25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,13,15,18-20 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13, 15, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 13 recites the limitation "the open and closed solenoid coils" in lines 5 and 6 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 13, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,251,671 to Hiroki.

Regarding claims 1, Hiroki discloses a valve control body comprising:

-a control body (1)

-opposing solenoid coils (51a,51b,53a,53b) positioned are respective end of the control body

-a longitudinally slideable spool (4) positioned within a bore (11) of the control body and between the opposing solenoid coils, the spool including a mechanism (81a) which at least minimizes fluid accumulation in a gap (not labeled, see Figure 1) between an end of the spool and at least one of the opposing solenoid coils, the permitting the spool to slide along its longitudinal axis in the bore.

Regarding claim 13, Hiroki discloses a valve control body comprising:

-a control body (1).

-a first solenoid coil (51a) positioned at a first end of the control body.

-a second solenoid coil (51b) positioned at an opposing end of the control body.

-a longitudinally slidable spool (4) positioned within the control body between the coils.

-means for minimizing fluid accumulation (81a) between a contact surface area between the spool and the first and second solenoid coils.

Regarding claim 24, the valve of Hiroki, acting as a replacement kit for a fuel injector, would inherently reduce latching effects between the spool and the end caps of the fuel injector due to the o-rings.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2-4, 15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,251,671 to Hiroki as applied to claim 1 and 13 above, and further in view of U.S. Patent No. 5,133,386 to Magee.

Regarding claim 2, the seal of Hiroki is not seated within a groove of the spool, but rather in the actuator casing. Magee discloses o-rings (19) seated within a groove of the spool. See Figure 1. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the valve of Hiroki by having o-rings located in the groove of the spool, as taught by Magee, in order to better retard internal leakage.

Regarding claims 3 and 15, the modified valve of Hiroki the o-ring is arranged about a circumference of the spool as taught by Magee.

Regarding claim 4, the modified valve of Hiroki would have the seal positioned proximate to the first end of the control body as taught by Magee.

Regarding claim 18, having the o-rings in the location taught by Magee would inherently prevent latching effects.

8. Claims 2-4, 15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,251,671 to Hiroki as applied to claim 1 above, and further in view of U.S. Patent No. 5,207,245 to Maranzano.

Regarding claim 2, the seal of Hiroki is not seated within a groove of the spool, but rather in the actuator casing. Maranzano discloses o-rings (46) seated within a groove of the spool. See Figure 2. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the valve of Hiroki by having

o-rings located in the groove of the spool, as taught by Maranzano, in order to better retard internal leakage.

Regarding claim 3 and 15, the modified valve of Hiroki the o-ring is arranged about a circumference of the spool as taught by Maranzano.

Regarding claim 4, the modified valve of Hiroki would have the seal positioned proximate to the first end of the control body as taught by Maranzano.

Regarding claim 18, having the o-rings in the location taught by Maranzano would inherently prevent latching effects.

9. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,964,406 to Zuo in view of U.S. Patent No. 5,133,386 to Magee.

Zuo discloses a fuel injector having:

-a body control valve having inlet port and working ports. See Figure 1.

-a first and second solenoid coil (13, 14) positioned at opposing ends of the control body.

-a slideably mounted spool (30) arranged between the first and second solenoid coils. See Figure 1.

-an intensifier chamber having a piston (50) and plunger (51) assembly, wherein the intensifier chamber is in fluid communication with the working ports. See Figure 1 and column 4 lines 21 to 45.

-a high pressure fuel chamber arranged below the portion of the plunger. See Figure 1.

-a needle chamber having a needle (60) responsive to an increased fuel pressure created in the high pressure chamber. See column 3 lines 39 to 55.

Zuo does not disclose means for minimizing fluid accumulation between the end of the spool and at least one of the fist and second solenoid coils. Magee discloses a valve assembly having a seal seated within a groove of a spool that minimizes fluid accumulation between the end of the spool and at least one of the fist and second solenoid coils. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuel injector of Zuo with the valve assembly of Magee in order to prevent fluid accumulation.

Response to Arguments

10. Applicant's arguments with respect to claims 1-4, 13, 15, 18, and 24 have been considered but are moot in view of the new ground(s) of rejection.

11. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the examiner maintains that one of ordinary skill in the art would know to use o-rings to minimize fluid accumulation, especially in view of the art of record. Furthermore, the argument

regarding the latching effect, see page 13, lines 14 to 18 of the arguments, has no bearing on claims 19 or 20 because that limitation is not recited in either of the claims.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seth Barney whose telephone number is (571)272-4896. The examiner can normally be reached on 7:30am-5:00pm (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel can be reached on (571)272-4919. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seth Barney
Examiner
Art Unit 3752

sb

JUSTINE R. YU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700

7/9/03